

REMARKS

Claims 1-14 and 21-29 were examined and rejected. Claims 15-20 have been previously withdrawn. Applicants amends, adds, and cancels no claims. Applicants respectfully request reconsideration of claims 1-14 and 21-29, in view of at least the following remarks.

I. Claims Rejected Under 35 U.S.C. § 103

The Patent Office rejects claims 1-14 and 21-29 under 35 U.S.C. § 103(a) as being unpatentable over European Patent EP 1085562 A2 to Thilderkvist (Thilderkvist), in view of U.S. Patent Application Publication 2002/0197803 A1 to Leitz et al. (Leitz). To render a claim obvious, all limitations of that claim must be taught or suggested by at least one properly combined reference.

Applicant respectfully disagrees with the rejection above and asserts that independent claims 1 and 21 are patentable over the cited references for at least the reasons that the references do not teach or suggest forming a silicon germanium layer on a substrate in a processing chamber, removing a portion of the silicon germanium layer in the processing chamber, and smoothing a surface of the silicon germanium layer in the processing chamber, as required by claims 1 and 21.

As noted by the Patent Office, Thilderkvist fails to disclose forming a silicon germanium layer in the same processing chamber as removing and smoothing.

Instead, the Patent Office relies upon the combination of Leitz with Thilderkvist to teach the above noted limitation. Leitz teaches forming a silicon germanium layer (see paragraph 30), but the Patent Office has not identified, and Applicant is unable to find any teaching in Leitz of removing or smoothing as claimed. Specifically, the Patent Office combines Leitz's teaching of forming a silicon germanium layer in a chamber with Thilderkvist's teaching of removing and smoothing in a chamber to satisfy the

claimed requirements of forming in the same processing chamber that used to remove and smooth.

However, Applicant asserts that the combination of Leitz with Thilderkvist would not motivate one having ordinary skill in the art to use the same chamber, as required by claims 1 and 21. Moreover, Applicant asserts that the combination is improper, as Thilderkvist teaches against forming in the same processing chamber that used to remove and smooth. Specifically, Thilderkvist teaches placing a substrate in a chamber (see feature 102 of Figure 1, paragraph 2, and 46) such as to treat or finish a silicon surface having a surface roughness of at least 0.2 nm RMS and up greater than 6 nm RMS (see paragraph 22 and 46), using a reactant gas mix comprising HCl and H₂ (see paragraph 23, 35, 46, 50, and 51-53). Specifically, Thilderkvist teaches that the wafer is placed in surface Treatment/Epi chamber 508 of tool 500 to treat or smooth the surface of the silicon film (paragraph 56-57) after a bond and cleave process is performed in bond/cleave 506 (see paragraph 61 and Figure 5), by moving the wafer into Treatment/Epi chamber 508 (paragraph 65) using transfer chamber 502 and load lock 512 (see paragraph 56 and Figure 5). For instance, after forming film 658 having very rough silicon surface 660 where silicon film 658 is separated from silicon substrate 652, wafer 600 (along with oxide 654 and silicon 658) is moved from bond/cleave 506, through transfer chamber 502 using loadlock 512, and into Treatment/Epi chamber 508 where surface 660 is treated (see paragraphs 56 and 65, and Figure 5).

Thus, one having ordinary skill in the art would not be motivated to use the same chamber to form the silicon germanium layer and remove and smooth the surface of the silicon germanium layer by combining Leitz with Thilderkvist, because Thilderkvist teaches against using the same chamber to perform those processes (see MPEP § 2145.X). Hence, for at least the reason above, Applicant respectfully requests the Patent Office withdraw the rejection of independent claims 1 and 21.

Addressing the “**Response to Arguments**” section in Final Office Action. Applicant’s argument is that the combination of references cited does not teach or suggest forming a silicon germanium layer in a processing chamber, removing a portion of that layer in the same processing chamber, and smoothing a surface of that layer in the same processing chamber, as required by claims 1 and 21. Whether a reference teaches forming a subsequent layer on the smoothed surface addresses the subsequent requirement of “forming a silicon layer on the smoothed surface of the silicon germanium layer” of claims 1 and 21, but does not teach the above noted requirement of forming a silicon germanium layer on a substrate in a processing chamber and removing and smoothing a portion of that layer in the same processing chamber.

In the Response to Arguments section, the Patent Office points out that it never states that Leitz teaches the step of removing and smoothing as claimed, but instead, clearly shows that Thilderkvist discloses both the removing and smooth step. Applicant agrees. Specifically, if Leitz does not teach removing and smoothing, so Leitz cannot teach or motivate removing and smoothing a layer formed in the same chamber where the removing and smoothing is to occur.

Moreover, Thilderkvist does not teach or suggest the above-noted forming, removing, and smoothing in the same chamber. In the Response to Argument section, the Patent Office points out that “teaching one way does not mean teaching a way.” Applicant agrees, unless “teaching one way” means teaching in a way that is logically opposed to the claimed requirement. This is the case here. Specifically, the claim requires forming, removing and smoothing of the same layer in the same chamber, while Thilderkvist teaches placing a substrate in a chamber before any removing or smoothing (see paragraphs 53 and 68), which is logically opposed to forming the layer in the same chamber in which removing and smoothing of that layer occurs. It can not be both ways, either Thilderkvist allows for the possibility of forming a layer and

removing a portion of that layer in the same chamber, or requires that the substrate be placed in the chamber prior to removing, every time, which is the case here, as pointed out by the Patent Office in the Response to Arguments section, page 6, lines 8-9.

Next, in the Response to Argument section, the Patent Office asserts that “Thilderkvist discloses that the removing and smoothing process can be performed in the same chamber with the deposit of silicon film by using chemical vapor deposition technique (paragraph 0053, 0068).” As noted above, this point is not germane to the claimed requirements of forming the silicon germanium layer, removing a portion of that layer, smoothing a surface of that layer, all in the same chamber.

Instead, the teaching focused on by the Patent Office addresses the claims subsequent requirement of forming a silicon layer on the smoothed surface of the silicon germanium layer. Specifically, paragraphs 53 and 68 of Thilderkvist teach a silicon film to be deposited on a smooth surface in a single chamber, but do not teach forming a layer which is going to be smoothed in the same chamber in which it is smoothed. In other words, Thilderkvist allows for smoothing a layer and forming a second layer on the smoothed layer in a chamber; but does not allow for forming a layer, smoothing that layer, and forming another layer on the smoothed layer in the same chamber.

Any dependent claims not mentioned above are submitted as not being anticipated or obvious, for at least the reasons given above in support of their base claims.

In addition to the reasons above for the independent claims from which dependent claims 11 and 28 depend, Applicant disagrees with the rejection above of dependent claims 11 and 28 for at least the reason that the cited references do not teach or suggest introducing a smoothing agent to the surface of the layer, following removing a portion of the layer, as required by claims 11 and 28.

Specifically, as noted above, Thilderkvist teaches introducing a gas including both HCl and H₂ into the chamber. In fact, Thilderkvist teaches specific ratios of the HCl to H₂ molecular concentration between 1:1000 to 1:100 (see paragraph 48).

Thus, Thilderkvist teaches a combined gas to perform removing and smoothing at the same time, however the Patent Office has not identified, and Applicant is unable to find any teaching in Thilderkvist of smoothing following removing, as claimed. Similarly, the Patent Office has not identified, and Applicant is unable to find any teaching in Leitz of smoothing following removing, as claimed. Hence, for at least the additional reason that neither Thilderkvist, Leitz, nor the combination teach or suggest the above noted limitations of claims 11 and 28, Applicant respectfully request the Patent Office withdraw the rejection above of dependent claims 11 and 28.

CONCLUSION

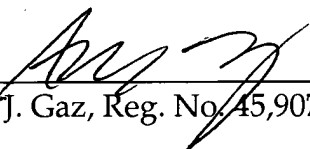
In view of the foregoing, it is believed that all claims now pending (1) are in proper form, (2) are neither obvious nor anticipated by the relied upon art of record, and (3) are in condition for allowance. A Notice of Allowance is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

 2/27/06

Amber D. Saunders Date